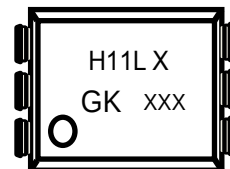
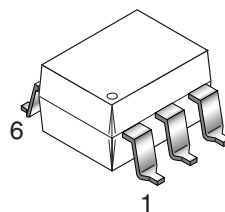


General Description

The H11LXS series of devices each consist of a GaAs infrared emitting diode optically coupled a high speed integrated circuit detector. The output detector incorporates a Schmitt trigger, which provides hysteresis for noise immunity and pulse shaping. The devices are in a 6-pin DIP package and available in wide-lead spacing and SMD option.



SOP-6

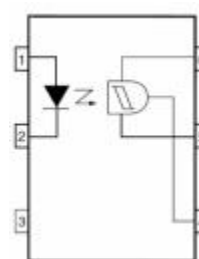
Features

- High data rate, 1MHz typical (NRZ)
- Free from latch up and oscillation throughout voltage and temperature ranges.
- Microprocessor compatible drive
- Logic compatible output sinks 16mA at 0.4V maximum
- Guaranteed on/off threshold hysteresis
- Wide supply voltage capability, compatible with all popular logic systems
- High isolation voltage between input and output ($V_{iso}=5000\text{ V rms}$)
- Compact dual-in-line package
- The product itself will remain within RoHS compliant version
- Compliance with EU REACH

Applications

Logic to logic isolator
Programmable current level sensor
Line receiver — eliminate noise and transient problems
AC to TTL conversion — square wave shaping
Digital programming of power supplies
Interfaces computers with peripherals

Schematic



Pin Configuration

1. Anode
2. Cathode
3. No Connection
4. V_O
5. GND
6. V_{CC}

Absolute Maximum Ratings ($T_a=25^\circ\text{C}$)

	Parameter	Symbol	Rating	Unit
Input	Forward current	I_F	60	mA
	Reverse voltage	V_R	6	V
	Power dissipation	P_D	120	mW
Output	V_{45} Allowed Range	V_O	0 to 16	V
	V_{65} Allowed Range	V_{CC}	3 to 16	V
	Output Current	I_O	50	mA
	Power dissipation	P_D	150	mW
	Total power dissipation	P_{tot}	250	mW
	Isolation voltage	V_{iso}	5000	V rms
	Operating temperature	T_{opr}	-55~+100	$^\circ\text{C}$
	Storage temperature	T_{stg}	-55~+125	$^\circ\text{C}$
	Soldering temperature ^{*2}	T_{sol}	260	$^\circ\text{C}$

Notes:

*1 AC for 1 minute, R.H.= 40 ~ 60% R.H. In this test, pins 1, 2 & 3 are shorted together, and pins 4, 5 & 6 are shorted together.

*2 For 10 seconds

Electro-Optical Characteristics (Ta=25°C unless specified otherwise)

Input

Parameter	Symbol	Min.	Typ.*	Max.	Unit	Condition
Forward Voltage	V_F	-	1.15	1.5	V	$I_F = 10\text{mA}$
Reverse Current	I_R	-	-	10	μA	$V_R = 5\text{V}$
Input capacitance	C_J	-	-	100	pF	$V=0, f=1\text{MHz}$

Output

Parameter	Symbol	Min.	Typ.*	Max.	Unit	Condition
Operation Voltage Range	V_{CC}	3	-	15	V	
Supply Current	$I_{CC(\text{off})}$	-	1.6	5	mA	$I_F=0\text{mA}, V_{CC}=5\text{V}$
Output Current, High	I_{OH}	-	-	100	μA	$I_F=0\text{mA}, V_{CC}=V_O=15\text{V}$
Isolation Resistance	R_{ISO}	10^{11}	-	-	Ω	$V_{I-O}=500\text{VDC}$

Transfer Characteristics

Parameter	Symbol	Min	Typ.	Max.	Unit	Condition
Supply Current	$I_{CC(\text{on})}$	-	1.6	5	mA	$I_F=10\text{mA}, V_{CC}=5\text{V}$
Output Voltage .low	V_{OL}	-	-	0.4	V	$V_{CC}=5\text{V}, I_F=I_{Fon}(\text{max.}), R_L=270\Omega$
Turn on Threshold Current ¹	H11L1S	-	-	1.6	mA	$V_{CC}=5\text{V}, R_L=270\Omega$
	H11L2S	-	-	10		
	H11L3S	-	-	5		
Turn off Threshold Current	I_{Foff}	-	1	-	mA	$V_{CC}=5\text{V}, R_L=270\Omega$
Hysteresis Ratio	I_{Foff}/I_{Fon}	0.5	-	0.9		$V_{CC}=5\text{V}, R_L=270\Omega$
Turn on Time	t_{on}	-	-	4	μS	$V_{CC}=5\text{V}, I_F=I_{Fon}, R_L=270\Omega$
Fall Time	t_r	-	0.1	-	μS	
Turn off Time	t_{off}	-	-	4	μS	
Rise Time	t_r	-	0.1	-	μS	
Data Rate		-	1	-	MHz	

* Typical values at $T_a = 25^\circ\text{C}$

¹. Max. $I_{F(ON)}$ is the maximum current required to trigger the output. For examples, a 1.6mA maximum trigger current would require the LED to be driven at a current greater than 1.6mA to guarantee the device will turn on. A 10% guard band is recommended to account for degradation of the LED over its lifetime. The maximum allowable LED drive current is 60mA.

RATING AND CHARACTERISTIC CURVES

Figure 1. Forward Current vs Forward Voltage

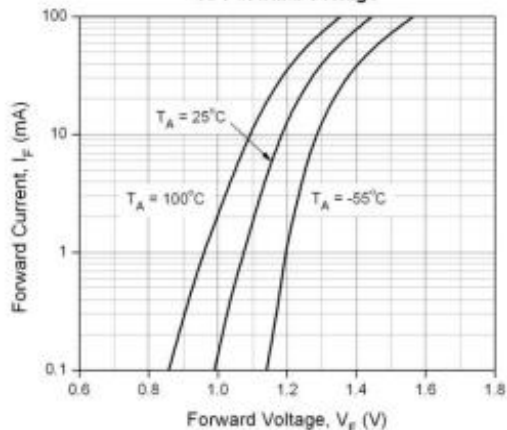


Figure 2. Transfer Characteristics

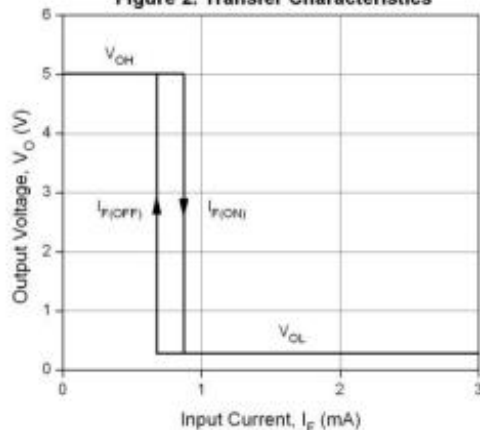


Figure 3. Turn On Threshold Current vs Supply Voltage

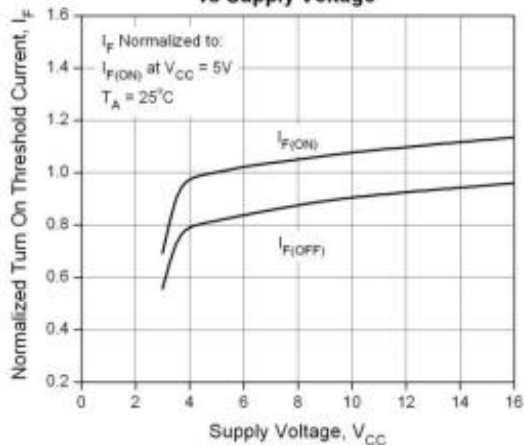


Figure 4. Turn On Threshold Current vs Ambient Temperature

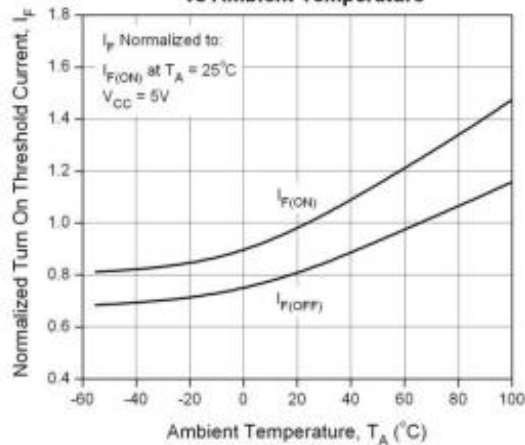


Figure 5. Low Level Output Voltage vs Load Current

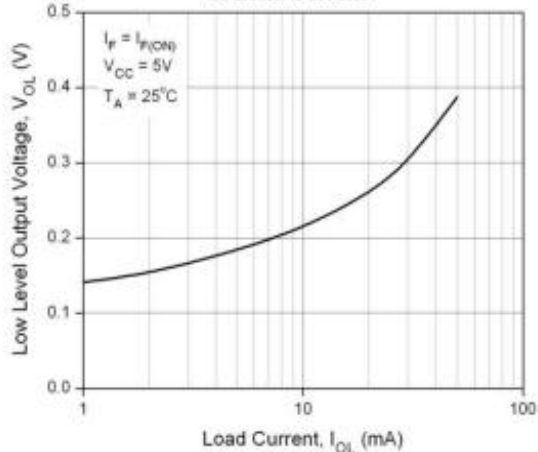
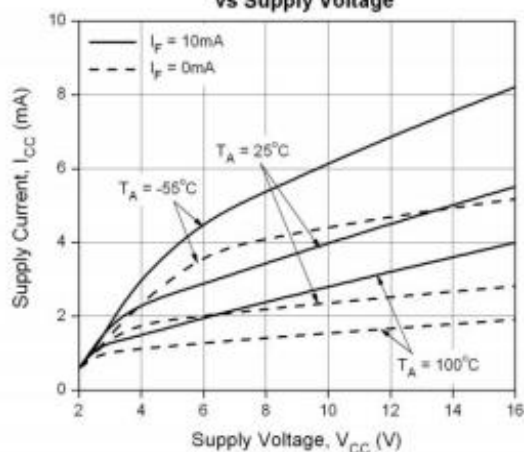


Figure 6. Supply Current vs Supply Voltage



RATING AND CHARACTERISTIC CURVES

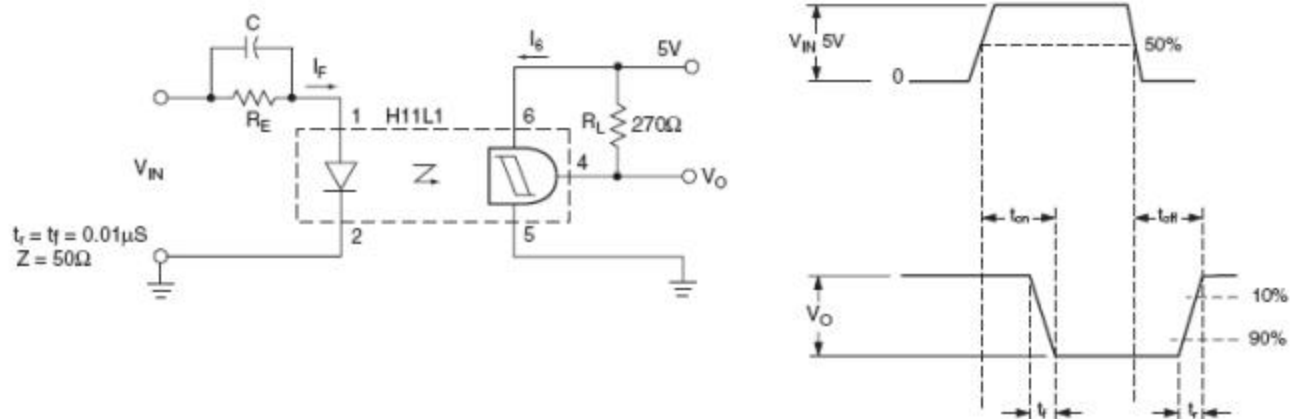
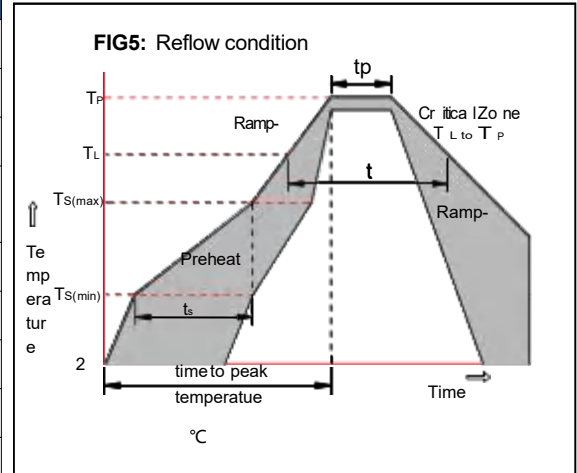


Figure 7. Switching Time Test Circuit & Waveforms

Soldering parameters

Reflow Condition		Pb-Free assembly (see as below)
Pre Heat	-Temperature Min ($T_{s(min)}$)	+150°C
	-Temperature Max($T_{s(max)}$)	+200°C
	-Time (Min to Max) (ts)	60-180 secs.
Average ramp up rate (Liquid us Temp (T_L) to peak)		3°C/sec. Max
$T_{s(max)}$ to T_L - Ramp-up Rate		3°C/sec. Max
Reflow	-Temperature(T_L)(Liquid us)	+217°C
	-Temperature(t_L)	60-150 secs.
Peak Temp (T_P)		+260(+0/-5)°C
Time within 5°C of actual Peak Temp (t_P)		30 secs. Max
Ramp-down Rate		6°C/sec. Max
Time 25°C to Peak Temp (T_P)		8 min. Max
Do not exceed		+260°C



Package Dimensions & Suggested Pad Layout

